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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,198	10/20/2003	Joseph D. Rainville	8540G-000213	4431
27572	7590	05/14/2010		
HARNESS, DICKEY & PIERCE, P.L.C.			EXAMINER	
P.O. BOX 828			EICHELMAYER, ALIX ELIZABETH	
BLOOMFIELD HILLS, MI 48303				
		ART UNIT	PAPER NUMBER	
		1795		
		MAIL DATE	DELIVERY MODE	
		05/14/2010	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/689,198

**Applicant(s)**

RAINVILLE ET AL.

**Examiner**

Alix Elizabeth Echelmeyer

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10,17 and 20-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10,17 and 20-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response***

1. This Office Action is in response to the reply filed February 19, 2010. No claims have been amended or added. Claims 10, 17, and 20-26 are pending and are rejected finally for the reasons given below.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10, 17, and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyagi et al. (US 2002/0172847) in view of Arnold et al. (US 6,647,724) and Lahiff (US 2003/0068538).

Aoyagi et al. teach a fuel cell power supply system including a compressor for controlling oxidant to a fuel cell ([0005]). The speed, or capacity, of the compressor is controlled by changing the motor speed based on the output of a controller ([0033], [0034]).

With regard to claim 17, Aoyagi et al. teach charging a capacitor with energy generated by the fuel cell ([0008]).

Aoyagi et al. fail to teach rapid transient modes.

Arnold et al. teach a variable speed compressor used to provide air (column 4 lines 26-36). The compressor has variable speed and is driven by a motor (column 3 lines 49-65).

The compressor further comprises a controller that can switch the power to the motor from one source to another, which allows for recharging of the power source not being used (column 4 lines 59-66). With regard to claim 18, the second power source is used during intermittent bursts of power, or rapid transient modes upward and the power source may be a capacitor or supercapacitor (column 5 line 66 - column 6 line 19).

When the compressor returns to normal operation after a burst, the capacity is inherently lower during normal operation as compared to during the burst.

It would be desirable to use the compressor of Arnold et al. in the system of Aoyagi et al. since the rapid transient modes of Arnold et al. would provide greater bursts of air to the fuel cell system when more power from the fuel cell is needed.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the compressor of Arnold et al. in the system of Aoyagi et al. since the rapid transient modes of Arnold et al. would provide greater bursts of air to the fuel cell system when more power from the fuel cell is needed.

Aoyagi et al. in view of Arnold et al. fail to teach the claimed "threshold rate" for the compressor. Aoyagi et al. teach that the amount of power produced by the fuel cell

is influenced by the amount of air provided to the fuel cell ([0005]). In the above combination, the compressor of Arnold et al. is used to control the amount of air provided. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine rate at which air should be provided to the fuel cell of Aoyagi et al., using the compressor of Arnold et al. to control the rate, since controlling the air controls the electrical output of the fuel cell. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (IIB).

Aoyagi et al. in view of Arnold et al. fail to teach charging of the capacitor with energy generated by regeneratively braking the compressor motor.

Lahiff teaches a compressor for controlling oxidant to a fuel cell (abstract). The compressor is controlled by a controller ([0040]).

Lahiff further teaches regenerative braking of another motor in the system, where the derived current is used to charge the battery ([0003]). One of ordinary skill in the art would recognize the advantages with using regenerative braking of a motor to charge a battery: energy that might otherwise be wasted during braking can be conserved.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to capture the braking energy from the motor used for the compressor of Lahiff in order to conserve that energy that would otherwise be lost. It has been found that using known techniques to improve similar devices is obvious to the skilled artisan. MPEP 2141 III.

***Response to Arguments***

4. Applicant's arguments filed February 17, 2010 have been fully considered but they are not persuasive.

It appears that Applicant has two main arguments: first, that the combination in the above rejection is not obvious, and second, that Arnold et al. do not teach rapid transient modes.

As to Applicant's first argument, the examiner is not convinced. Applicant's states, in the first full paragraph of page 3, that Aoyagi et al. fail to teach a controller form monitoring power demand and then selecting a power source for the compressor. The examiner finds that the selection of power source is found in Arnold et al., since Arnold et al. teach selection of a power source based on demand to the compressor. In the combination of the compressor system of Arnold et al. and the compressor system of Aoyagi et al., or the substitution of the compressor system of Arnold et al. for the compressor system of Aoyagi et al., this limitation is inherent. The compressor system of Arnold et al. requires the two power sources to provide the necessary power boosts.

As to Applicant's second argument, even assuming that Applicant is correct in the interpretation of the on/off power of the compressor, the skilled artisan will realize that not only is the compressor of Arnold et al. capable of running constantly given sufficient power, the skilled artisan would also know that it is necessary to run a fuel cell compressor constantly in order to provide oxidant to the fuel cell so that the fuel cell will produce electricity. The rapid "boosts" of the compressor of Arnold et al. would provide

the needed motor speed changes required by the compressor of Aoyagi et al. ([0034]). And, the skilled artisan will recognize that the additional power sources would provide more power for those motor speed changes, resulting in the rapid transient modes of the instant invention.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795

Alix Elizabeth Echelmeyer  
Examiner  
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aee